REMARKS

Claims 1-27 remain pending in the instant application. Claims 1-27 presently stand rejected. Claims 1-3, 7-19, 22, and 27 have been amended. No new matter has been added. Reconsideration of the pending claims is respectfully requested.

Drawings

The Non-Final Office Action mailed on November 20, 2007 indicated that the drawings submitted on March 18, 2004 are objected to by the Examiner. Replacement sheets have been provided as indicated in the Office Action.

Specification

The abstract of the disclosure is objected to because it is currently two paragraphs. Accordingly, Applicants have corrected the specification to cure these minor formalities. The corrections are believed to introduce no new matter.

Claim Rejections – 35 U.S.C. § 112

Claim 27 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly pint out and distinctly claim the subject matter which applicant regards as the invention. The claim has been amended to address the rejection.

Claim Rejections – 35 U.S.C. § 103

Claims 1-4, 7, 10-12, 14-15, 18 and 22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over "Global Compaction of Horizontal Microprograms Based on

the Generalized Data Dependency Graph:, Sadahiro Graph et al, 1983 (Graph) in view of "Compilers Principles, Techniques, and Tools" published September 12, 1985, by Alfred V. Aho et al. (Aho).

"To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. All words in a claim must be considered in judging the patentability of that claim against the prior art." M.P.E.P. § 2143.03.

Claim 1 as amended recites:

identifying in a pre-boot environment a plurality of module-to-module interfaces from a plurality of firmware modules, wherein a module-to-module interface allows a first firmware module of the plurality of firmware modules to invoke a second firmware module of the plurality of firmware modules;

identifying in the pre-boot environment a plurality of dependency expressions corresponding to the plurality of firmware modules, wherein each dependency expression of a firmware module describes the module-to-module interfaces needed for execution of the firmware module;

evaluating in the pre-boot environment the dependency expressions to determine an optimized pre-boot dispatch order of the firmware modules;

dispatching in the pre-boot environment the firmware modules in response to the determined pre-boot dispatch order; and

providing pre-boot services to the dispatched firmware modules wherein the pre-boot services comprise temporary management of random access memory in the pre-boot environment.

Graph is directed towards global compaction of horizontal microprograms. Aho is directed towards compiler principles. Thus, neither Graph nor Aho, singly, or in motivated combination, teach (for example) the problems of working in a pre-boot environment, where operating system services and programs for compiler development are readily available. For example, both Aho and Graph assume loading and running executable programs under the control of an operating system. However, the pre-boot environment does not have such operating system services and programs available in the pre-boot environment. Also, the pre-boot environment has special problems that it addresses such as minimizing boot time cycles where an OS is not running and the handling of multiple processors in the pre-boot environment (see dependent claim 7, for example). Accordingly, claim 1 is not taught or fairly suggested by the cited references.

Claim 11 as amended recites:

An article of manufacture comprising:

a machine-accessible medium including a plurality of instructions which when executed perform operations comprising:

entering a pre-boot environment;

initializing in the pre-boot environment a Pre-EFI Initialization (PEI) foundation that includes a PEI Services Table that is accessible by PEI modules

(PEIM) in the computer system, wherein each PEIM comprises a dependency expression, and wherein the PEI foundation comprises a PEIM dispatcher;

using the PEI foundation to provide PEIM services to the PEIMs; and

using the PEIM dispatcher to dispatch the PEIMs in accordance with the dependency expression of each PEIM.

Claim 11 is allowable for at least the reasons stated above for claim 1.

Claim 18 as amended recites:

A computer system, comprising:

a processor; and

a magnetic storage device operatively coupled to the processor, the magnetic storage device including instructions which when executed by the processor perform operations comprising:

collecting in a pre-boot environment a dependency expression from each of a plurality of firmware modules;

collecting metadata from each of the plurality of firmware modules, the metadata describing module-to-module interfaces produced by a firmware module of the plurality of firmware modules;

sorting the plurality of firmware modules into an optimized order based on the dependency expressions and the metadata; and

dispatching in the pre-boot environment the plurality of firmware modules in the optimized order.

Claim 18 is allowable for at least the reasons stated above for claim 1.

Claim 22 as amended recites:

> A system, comprising:
>
> data which encodes a set of firmware modules in a predetermined order, the predetermined order defined according to:
>
> a dependency expression associated with each firmware module of the set of firmware modules; and
>
> metadata associated with each firmware module, the metadata describing module-to-module interfaces produced by each firmware module; and
>
> code which in a pre-boot environment executes the set of firmware modules according to the predetermined order.

Claim 22 is allowable for at least the reasons stated above for claim 1.

Claims 5-6, 8, 9, 13, 16-17, 19, 21 and 23-27 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Graph and Aho as applied to claims 1-4 and 7, and further in view of EFI Specification 1.02 released by Intel on December 12, 2000 as documented by Wikipedia (EFI, bottom of first page). Claim 20 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Graph and Aho as applied to claims 1-4, 7, and 10 above, and further in view of Downloading new versions of firmware as taught

by HP OpenView, A Guide to Hewlitt-Packard's Network and System Management Platform, Nathan Muller, 1995.

The Office action asserts that one of ordinary skill in the art at the time of invention would have known to employ the teachings of Graph and Aho in the effort to optimize firmware and the implement Extensible firmware Interface, because EFI provides an interface to the operating system including the BIOS. Applicants traverse this assertion because the operating system is not executing at the time of the pre-boot environment, and thus cannot provide the services taught by Graph and Aho.

The dependent claims are nonobvious over the cited references for at least the same reasons as discussed above in connection with their respective independent claims, in addition to adding further limitations of their own. Accordingly, Applicants respectfully request that the instant § 103 rejections of the dependent claims also be withdrawn.

CONCLUSION

In view of the foregoing remarks, Applicants believe the applicable rejections have been overcome and all claims remaining in the application are presently in condition for allowance. Accordingly, favorable consideration and a Notice of Allowance are earnestly solicited. The Examiner is invited to telephone the undersigned representative at (206) 292-8600 if the Examiner believes that an interview might be useful for any reason.

CHARGE DEPOSIT ACCOUNT

It is not believed that extensions of time are required beyond those that may otherwise be provided for in documents accompanying this paper. However, if additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. § 1.136(a). Any fees required therefore are hereby authorized to be charged to Deposit Account No. 02-2666. Please credit any overpayment to the same deposit account.

Respectfully submitted,
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